

The North American Areodina with a Description of a New Genus from California

(Coleoptera: Scarabaeidae)

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The subtribe Areodina (of the tribe Rutelini) has been defined by Ohaus (1918, 1934) to include six genera; two occur north of Panama, and one reaches the United States. North American authors have generally considered *Cotalpa* (sensu Ohaus) to comprise four genera (subgenera, Ohaus), three of which occur in the United States. These four genera (*Cotalpa*, *Byrsopolis*, *Paracotalpa*, and *Parabyrsopolis*) have been the objects of much recent confusion.

Cotalpa was named by Burmeister (1844: 423) with *Scarabaeus lanigera* Linnaeus 1758 as the type species. In the same paper he (Burmeister, 1844: 425) named *Byrsopolis* for *Byrsopolis castanea* n. sp., from South America. Various species were named in the two genera until 1915, when both Ohaus (1915) and Casey (1915) published new names for the same taxa. Casey described the genera *Pocalta* (1915: 92) for the species of *Cotalpa* with dorsal hair, and *Parareoda* (1915: 99) for the Central American and Mexican *Byrsopolis*. Ohaus published the names *Paracotalpa* (1915: 256) for the dorsally haired species, and *Parabyrsopolis* (1915: 256) for the Central American and Mexican forms, and, with *Byrsopolis*, placed these as subgenera of *Cotalpa*. Casey's names, published in English and more widely read in North America, were used by the majority of systematists in the United States. Ohaus (1925: 75) pointed out that his work, which appeared on 1 July 1915, had priority over Casey's (27 November 1915), and his (Ohaus') names were the valid ones. Subsequent authors have generally used Ohaus' nomenclature, while following Casey's generic concept. Recently however, things have become confused by the unexplained placement of *Parabyrsopolis* as a synonym of *Paracotalpa* (Arnett, 1963: 424), without indicating placement for the species formerly included in *Parabyrsopolis*. Saylor (1940: 191) added to the generic nomenclature of this group by naming *Ciocotalpa* as a new subgenus of *Cotalpa* (sensu stricto) for *Cotalpa consobrina* Horn.

The species placed in these genera have also been subjected to varying amounts of confusion. Following is a brief treatment of each genus, as recognized by this author.

BYRSOPOLIS Burmeister

Byrsopolis Burmeister 1844:425; Lacordaire 1856:364; H. Bates 1888:290; Ohaus 1912:312, 1915:256, 1918:10, 1934:37. Type = *Byrsopolis castanea* Burm. 1844:425.

This genus consists of approximately six species, restricted to South America. Ohaus (1912: 314) named a new species "*Byrs. nigroaenea*," which, since his later treatment of *Byrsopolis* as a subgenus of *Cotalpa*, became a junior homonym of *Byrsopolis nigroaenea* Bates (1888: 289). He later evidently intended the name *fuscoaenea* as a new name for this taxon. Both of the lists prepared by him, in the *Coleopterorum Catalogus* (1918) and in the *Genera Insectorum* (1934) cite *Byrsopolis fuscoaenea* as described on the page where "*Byrs. nigroaenea* n. sp." is named (this taxon is presently placed in *Parabyrsopolis*, where the name is still a junior homonym with *Parabyrsopolis nigroaenea* (Bates) 1888: 289). If in fact Ohaus intended the name *fuscoaenea* to replace his *B. nigroaenea*, as seems likely, he did not completely cite the change. The complete, correct citation should be as follows:

Parabyrsopolis fuscoaenea (Ohaus) 1918:11 (for *Byrsopolis nigroaenea* Ohaus 1912: 314 *nec.* Bates 1888:289).

PARABYRSOPOLIS Ohaus

Parabyrsopolis Ohaus 1915:256, 1918:11, 1934:39.

Parabysopolis, Arnett 1963:424 (misspelling of *Parabyrsopolis*).

Parareoda Casey 1915:99.

This genus has been generally ignored by recent American workers. These beetles are quite distinctive, as outlined in the key, and should be given valid generic status. At present there are two names in the literature for taxa known in the United States, both from Arizona. A generic revision is needed, and until that time I will consider both names as representing distinct species although further material may show that this is not the case.

COTALPA Burmeister

Cotalpa Burmeister 1844:423; Lacordaire 1856:366; Horn 1867:168, 1871:338; H. Bates 1888:289; Wickham 1905:1; Ohaus 1915:256, 1918:9, 1925:75, 1934:35; Casey 1915:88; Saylor 1940:190; Arnett 1963:423. Type = *Scarabaeus lanigera* Linnaeus 1758:350.

Ciocotalpa Saylor 1940:191. Type = *Cotalpa consobrina* Horn 1871:377.

I follow Saylor's treatment of this genus, although he seems to recognize variants as subspecies, without any geographical criteria. Casey's subspecies (*C. lanigera obesa* Casey 1915: 90) may not be valid. There

are evidently new species of this genus from Mexico (Howden, personal communication). It should be noted that the date of the original description for *Scarabaeus lanigera* Linnaeus, is 1758, *not* 1764 as is usually cited (see Landin 1956: 10).

PARACOTALPA Ohaus

Paracotalpa Ohaus 1915:256, 1918:10, 1925:75, 1934:38; Saylor 1940:194; Arnett 1953:30. Type = *Cotalpa ursina* Horn 1871:337.

Pocalta Casey 1915:92; Fall 1932:203. Type = not designated.

I agree with the treatment of Saylor (1940), except for the "subspecies" of *P. ursina* as treated in his work. *Paracotalpa ursina* Horn is a very common, very variable species in Southern California. I do not believe that any of the trinomials that Saylor uses are valid geographic populations. Rather they represent combinations of the normal variation and melanism, since several "subspecies" have been collected at the same localities. At present it seems best to consider the diverse *P. ursina* as without subspecies until an in-depth study properly utilizing geography is completed.

CHECKLIST OF THE AREODINA OF THE UNITED STATES

Parabyrsopolis Ohaus

- arizonae* (Ohaus) 1915:313 (*Byrsopolis*) Ariz.
rufobrunnea (Casey) 1915:100 (*Pararoeda*) Ariz.

Cotalpa Burmeister

- consobrina* Horn 1871:337 Ariz.
flavida Horn 1878:53 Utah, Nev., Ariz.
lanigera (Linnaeus) 1758:350 (*Scarabaeus*) New England to Fla., to Iowa
obesa Casey 1915:90
vernica Casey 1915:91
molaris Casey 1915:90
tau Wickham 1905:2
subcibrata Wickham 1905:3 Kansas

Paracotalpa Ohaus

- granicollis* (Haldeman) 1852:374 (*Cotalpa*) Wash., Ore.
pubicollis (Casey) 1915:98 (*Pocalta*) S. Cent. Calif. to Utah, Colo., Nev.
deserta Saylor 1940:195 S. Calif., N. Baja Calif.
puncticollis (LeConte) 1863:78 (*Cotalpa*) S. Calif. to N. M.
ursina (Horn) 1867:95 (*Cotalpa*) S. Calif.
laevicauda (Casey) 1915:95
brevis (Casey) 1915:95
leonina (Fall) 1932:204
piceola Saylor 1940:197
rotunda (Casey) 1915:96
seriata (Casey) 1915:96
nigripennis (Casey) 1915:97
rubripennis (Casey) 1915:97

Pseudocotalpa Hardy n. gen.
andrewsi Hardy n. sp.

S. Calif.

***Pseudocotalpa* Hardy, new genus**

TYPE SPECIES.—*Pseudocotalpa andrewsi* Hardy, new species.

Body form robust. Clypeus deeply concave, with anterior and lateral margins forming high vertical carina between ocular canthi. Clypeus separated from front by complete suture swinging toward vertex centrally. Disc of clypeus with large punctures. Vertex impunctate, gradually becoming punctate towards clypeal suture. Ocular canthus thin; provided with long, pale hairs; not extending more than one-third distance across eye. Eye large, globular, only slightly flattened posteriorly, black. Entire head pale except portions of clypeal suture and marginal carina. Antennae 10 segmented, with three segmented club. Labrum thin, bilobed, at least three times wider than long. Mandible with outer edges rounded, without external teeth. Maxillae with five or six teeth internally; palp four segmented with fourth segment enlarged, longer than other three segments, and longer than entire body of maxilla. Apical palpal segment with deeply impressed groove on outer edge, running entire length. Labium small, nearly parallel sided, as wide as long; bilobed apically between insertion of palps. Prothorax fringed anteriorly, posteriorly, and laterally with long, dense, pale hairs. Thorax with scattered fine punctures, punctures usually separated by own width or more. Prothorax margined anteriorly and posteriorly. Postcoxal prosternal spine poorly developed, not present as well developed knob. Prothorax ventrally with long, fine, pale hairs. Elytra with poorly defined striae represented by scattered punctures. Flight wings well developed. Scutellum clothed with sparse covering of fine, long, pale hair. Abdomen generally covered with pale hair except for central portions of ventral sternites. Six abdominal sternites visible from below. Without well developed process between mesocoxae. Pygidial margin complete. Anterior tibia tridentate, with or without apical spur. Middle tibia with inner edge straight, outer edge gently rounded, apically supplied with one or two spurs and a number of fine, long spinules. Posterior tibia enlarged at apex, with one or two spurs; outer edge fimbriate with long spinules. All tarsal claws simple, not cleft, all chelate.

The genus *Pseudocotalpa* may be distinguished from closely related genera in the Areodina by the distinctive shape of the clypeus, *Pseudocotalpa* being the only genus in which the clypeus is deeply concave; and by the poorly developed prothoracic postcoxal spine or knob, which is well developed and evident in other genera. The enlarged, deeply grooved maxillary palp is also characteristic.

***Pseudocotalpa andrewsi* Hardy, new species** (Figs. 1-4)

HOLOTYPE MALE.—greatest length 17.5 mm, width at elytral humeri 8.8 mm. Disc of clypeus with small, yellowish setae emerging from many of the punctures. Apical segment of labial palp cone-shaped, slightly impressed on dorsal surface. Disc of prothorax glabrous, sparsely punctured; punctures separated by at least own diameter, becoming closer laterally, until rugose at lateral edges. Anterior

angles poorly defined, lateral margins rounded down to ventral surface, lateral margin present only as fine carina. Elytra glabrous, except for tuft of hair at articulation. Pygidium apically rugulose, becoming slightly more rugose basally. Dense pale hairs laterally and basally. Apex of mesotibia with two apical spurs. Apex of metatibia with a single apical spur. All other characters as in generic description.

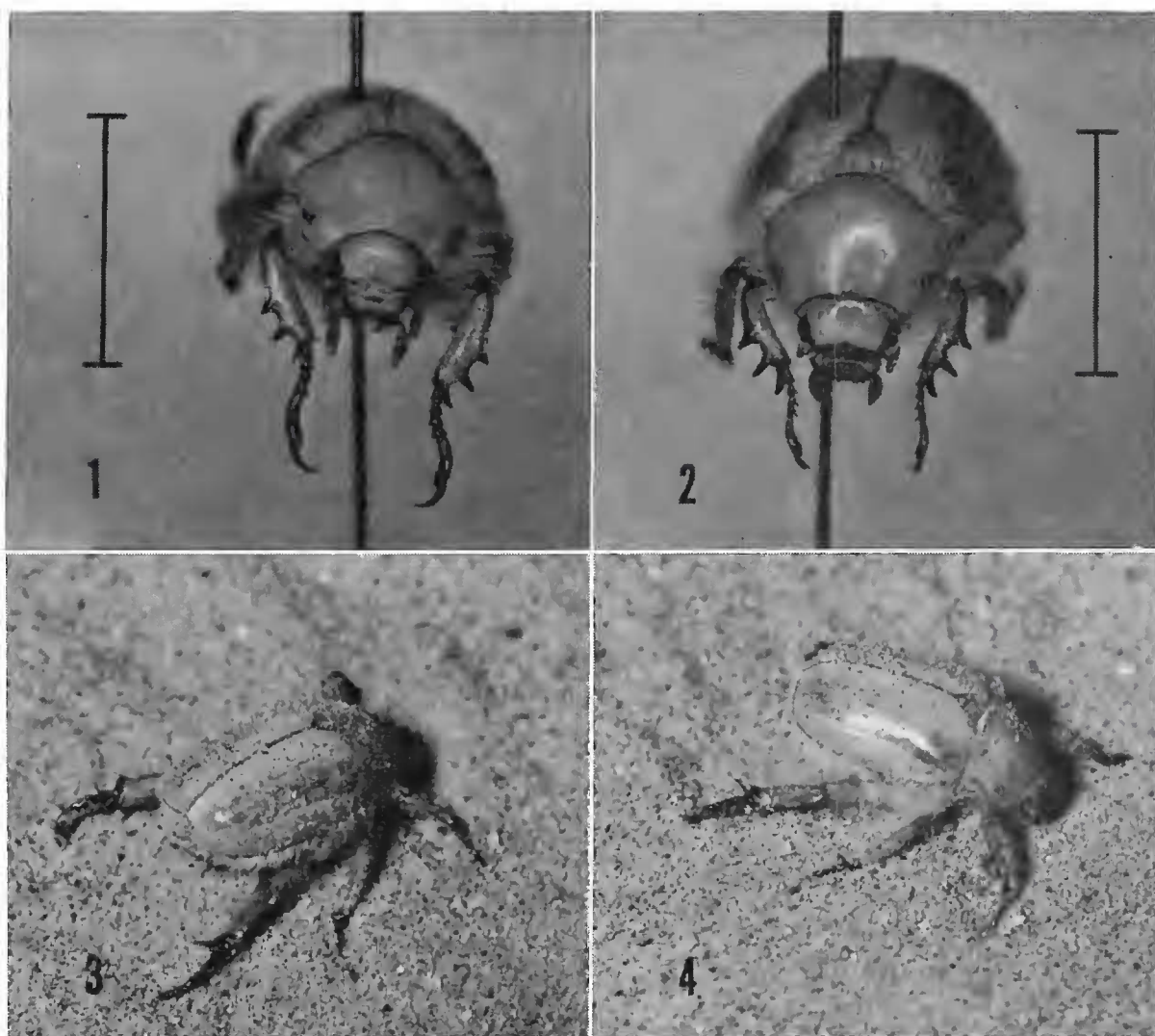
ALLOTYPE FEMALE.—greatest length 16.8 mm; width at elytral humeri 8.6 mm. Differs from the male in these respects: Maxillary palpi not as large, antennal club slightly shorter, anterior tibiae with spines longer and finer, with deeper emarginations between spines. All tarsi smaller, posterior tarsi flatter and wider. Abdomen more robust. Mesotibia with single apical spur.

PARATYPE VARIATION IN SERIES: Males 13.7 mm to 17.6 mm; females 14.2 mm to 18.4 mm. Morphologically most agree with the holotype or allotype, except in the character of the apical tibial spurs. Of the 118 paratypes (101 males, 17 females) 78 (64 males, 14 females) had only one apical spur on both the middle and hind tibia; 35 (32 males, 3 females) had vestiges of the second apical spur on the mesotibia; while 5 (males) had the second spur present on both mesotibia and metatibia. Evidently this is a character in the process of change as both spurs are present and well developed in other genera of Areodina. The protibial spur is absent from most, but present on some individuals.

Holotype male (Calif. Acad. Sci. # 10648), Glamis, Imperial County, California, 23 April 1970, A. R. Hardy and J. W. Prichard. Allotype (Calif. Acad. Sci.) and 107 paratypes (90 males, 17 females), same data as holotype, A. R. Hardy and J. W. Prichard. Additional paratypes, all from Imperial County, California include: 7 males, Glamis, 5 May 1970, A. R. Hardy and B. S. Cheary; 1 male, Glamis, 22 April 1967, F. G. Andrews; 2 males, Glamis, blacklight, 12 April 1969, A. R. Hardy; 1 male, Yuma Dunes, 30 April 1960, Betty Aaron.

Paratypes deposited in these collections: California Academy of Sciences; University of California, Riverside; University of California, Berkeley; University of California, Davis; Los Angeles County Museum; California State College, Long Beach; United States National Museum; American Museum of Natural History; Canadian National Collection; Illinois Natural History Survey Collection; Museum of Comparative Zoology; Texas A&M University; British Museum of Natural History; Humboldt University (Berlin); California Dept. of Agriculture; Field Museum of Natural History (Chicago); Cornell University; Henry F. Howden; Fred Andrews; Terry Taylor; James Robertson; Brian Cheary; Dave Verity; and the collection of the author.

REMARKS.—An additional specimen from 5 mi. S. Ogilby taken in February was also examined, but was excluded from the type material because the specimen showed differences in the main characteristics of *P. andrewsi* sufficient perhaps to indicate a distinct taxon. More material needs to be examined before it can be placed.



FIGS. 1-4, *Pseudocotalpa andrewsi* Hardy, n. gen., n. sp. FIG. 1, Female Allotype. Line equal to one cm. FIG. 2, Male Holotype. Line equal to one cm. Note anterior tibiae which are narrower than in female. Note also deeply excavated, enlarged maxillary palp. FIGS. 3 & 4. Beetle on surface of sand after recent emergence from dune (see text).

That *Pseudocotalpa* has managed to escape detection for so long is due no doubt to the secretive habits of this insect. On 23 April 1970, collection of a large series was made, and observations on the behavior noted. *Pseudocotalpa* was noted emerging from the troughs of loose, drifting dunes, in the latter part of twilight. As darkness started to rapidly increase, the insects would burrow to the surface, where they would remain partially buried, with the head exposed, until the proper conditions, when, as if on a signal, large numbers would climb out onto the surface of the dune (Figs. 3 & 4), and after a moment begin to fly. The air was generally still, and the beetles would fly over the dunes at a height of several inches. When a breeze did move the air, males would orient upwind, and search until a female was found resting on the sand. At such time, copulation would occur. Evidently following

a pheromone gradient, numbers of males would occasionally descend on a single female.

After flight that lasted for from 10 to 15 minutes, the beetles disappeared as rapidly as they had appeared. Following marks on the sand, the author located one individual that had rapidly burrowed approximately six inches into the sand. Extensive sifting has been conducted in these dunes in search of insects, with depths of several feet excavated, without the location of a single individual. Evidently the days are passed deep in the sand. While nearly 100 specimens were collected by hand on the dunes, a blacklight set up only a few yards away took about six specimens. Two weeks later (5 May) only seven examples were collected at the same locality. Occasional stragglers would come to the light on that occasion for as much as an hour after the initial flight time.

I take pleasure in naming this species after Mr. Fred Andrews, who first called this species to my attention.

KEY TO THE GENERA OF AREODINA OF AMERICA NORTH OF MEXICO

1. Postcoxal prothoracic spine poorly developed, not overtopping coxae, reduced to height of base of coxa; clypeus deeply concave, surrounded on sides and in front by equally reflexed clypeal margin; fourth segment of maxillary palp deeply impressed on anterior edge. S. Calif. -----
----- *Pseudocotalpa* Hardy, n. gen.
Postcoxal prothoracic spine well developed, often extending to level of coxal apex; clypeus either flat on disc, or if curved, lateral margins not reflexed to same degree as anterior edge; fourth segment of maxillary palp normal 2
2. Prothorax, and usually elytra, provided with dorsal hairs; all tarsal claws of both sexes simple; prothorax metallic blue, black or green -----
----- *Paracotalpa* Ohaus
Upper surface glabrous; at least anterior tarsal claws of male cleft, all claws of female simple; prothorax metallic yellow or golden, or reddish brown 3
3. Clypeus parabolic; anterior edge reflexed; clypeus densely rugosely punctured. Color reddish brown ----- *Parabyrsopolis* Ohaus
Clypeus transverse; anterior angles rounded; clypeus finely punctured. Color yellow or golden ----- *Cotalpa* Burmeister

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